

## **Amendments to the Claims**

This listing of claims will replace all prior versions and listings of claims in the application.

### **Listing of Claims:**

1. (Currently amended) A method to predict athletic performance in an individual a mammal comprising:
  - a) obtaining one or more samples from an individual a mammal;
  - b) analyzing the sample for the presence of one or more genetic variations in the  $\alpha$ -actinin-3 (ACTN3) gene; and
  - c) predicting athletic performance based on the presence of the one or more genetic variations wherein the athletic performance is selected from at least one of sprint performance, endurance performance, power performance and strength performance.
2. (Currently amended) The method of claim 1, wherein the individual mammal is a human.
3. (Currently amended) The method of claim 1, wherein the individual mammal is a horse, a dog or a camel.
4. (Currently amended) The method of claim 1, further comprising screening the individual mammal for a 1747 C>T single nucleotide polymorphism (SNP) in the ACTN3 gene.
5. (Currently amended) The method of claim 1, further comprising genotyping the individual mammal at the ACTN3 locus.
6. (Original) The method of claim 5, wherein the presence of at least one copy of the 577R allele of the ACTN3 gene is positively associated with sprinting or power performance.
7. (Currently amended) The method of claim 6, wherein genotyping the individual mammal as a 577RR genotype is positively associated with sprinting or power performance.

8. (Currently amended) The method of claim 6, wherein genotyping the individual mammal as a 577XX genotype is negatively associated with sprinting or power performance.
9. (Currently amended) The method of claim 6, wherein genotyping the individual mammal as a 577XX genotype is positively associated with endurance performance.
10. (Currently amended) The method of claim 6, wherein genotyping the individual mammal as a 577RX genotype is positively associated with sprinting or power performance in female individuals.
11. (Currently amended) The method of claim 6, wherein genotyping the individual mammal as a 577RX genotype is negatively associated with endurance performance in female individuals.
12. (Currently amended) The method of claim 1, further comprising measuring the amount of ACTN3 protein present in the individual's mammal's skeletal muscle.
13. (Original) The method of claim 12, wherein the amount of ACTN3 protein is measured using an antibody specific for the ACTN3 protein.
14. (Currently amended) The method of claim 1, further comprising measuring the amount of ACTN3 messenger RNA (mRNA) expressed in the individual's mammal's skeletal muscle.
15. (Currently amended) The method of claim 4, further comprising identifying the 1747 C>T SNP alleles in the individual's mammal's genomic DNA by DNA sequencing, allele-specific hybridization, allele-specific amplification or restriction fragment length polymorphism analysis.
16. (Currently amended) The method of claim 4, further comprising screening the individual mammal for the presence of one or more additional SNPs in the ACTN3 gene.

17. (Canceled)

18. (Currently amended) The method of claim 1, further comprising screening the individual mammal for the presence of one or more genetic variations in at least one other gene.

19-23 (Canceled)

24. (Currently amended) The method of claim 1, further comprising screening the individual mammal using a test selected from the group consisting of VO<sub>2</sub> maximum, anaerobic threshold test, Wingate test, critical power, resting metabolic rate, body composition, speed testing, power testing, strength testing, flexibility testing, muscle biopsy, fast twitch fiber test and slow twitch fiber test.

25. (Currently amended) The method of claim 1, further comprising selecting the individual's mammal's training program based on the presence of the one or more genetic variations to optimize strength, power, endurance or a combination thereof.

26. (Currently amended) The method of claim 25, wherein the individual mammal is a human, a horse, a dog or a camel.

27. (Currently amended) The method of claim 25, further comprising screening the individual mammal for a 1747 C>T single nucleotide polymorphism (SNP) in the ACTN3 gene.

28. (Currently amended) The method of claim 25, further comprising genotyping the individual mammal at the ACTN3 locus.

29. (Currently amended) The method of claim 1, further comprising selecting the individual's mammal's sprint/power type sport or event or endurance sport or event on the basis of the presence of the one or more genetic variations.

30. (Currently amended) The method of claim 29, wherein the individual mammal is a human, a horse, a dog or a camel.

31. (Currently amended) The method of claim 29, further comprising screening the individual mammal for a 1747 C>T single nucleotide polymorphism (SNP) in the ACTN3 gene.

32. (Currently amended) The method of claim 29, further comprising genotyping the individual mammal at the ACTN3 locus.

33. (Previously presented) The method of claim 1, wherein analyzing the sample further comprises analyzing DNA of the sample.

34. (Previously presented) The method of claim 1, wherein the genetic variation is a SNP.

35. (Currently amended) A method to predict athletic performance in an individual a mammal comprising:

- a) obtaining one or more samples from an individual a mammal;
- b) analyzing the sample for the presence of one or more genetic variations in the ACTN3 gene;
- c) identifying ACTN3 577 genotype (577XX, 577RX and 577RR); and
- d) predicting athletic performance based on the presence of the one or more genetic variations in the ACTN3 gene and the ACTN3 577 genotype wherein the athletic performance is selected from at least one of sprint performance, endurance performance, power performance and strength performance.

36. (Currently amended) The method of claim 35, further comprising screening the individual mammal for a 1747 C>T single nucleotide polymorphism (SNP) in the ACTN3 gene.

37. (Previously presented) The method of claim 35, further comprising identifying the ACTN3 577 genotype using a protein assay.

38. (Previously presented) The method of claim 37, wherein the assay is an ELISA assay.

39. (New) The method of claim 35, wherein the mammal is a dog or a human.

40. (New) The method of claim 35, further comprising selecting the mammal's training program based on the presence of the one or more genetic variations to optimize strength, power, endurance or a combination thereof.